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PATENT SPECIFICATION
DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Improvements in or relating to the Manufacture of
Toy Figures

I, WONG TAI KAM, of Chinese Nationality, of 44, Western Street, Hong Kong, trading as GENERAL POLYMER WORKS, hereby declare the invention for which I pray that a 5 patent may be granted to me, and the method by which it is to be performed to be particularly described in and by the following statement:—

This invention relates to the manufacture 10 of toy figures, such as toy human or toy animal figures, of that kind consisting of a moulding of a generally flexible material incorporating a metallic wire stiffener.

A first object of the invention is to provide an improved arrangement of stiffener 15 which is adapted to prevent moving apart of its portions, i.e. is resistant to stretching, or separation one from another, of parts such as the limbs of a toy figure.

A second object of the invention is to provide an improved method of moulding such 20 figures.

According to the present invention, a metallic wire stiffener for incorporation in a toy 25 human or animal figure of moulded flexible material comprises elongated elements (corresponding for example to limbs and the head and neck of the eventual figure) and a body (corresponding for example to the trunk of 30 the eventual figure), all of said elements and the body being formed from the same continuous length of wire, the elongated elements being formed from two passes of said wire twisted together, the body including a portion 35 of wire adjacent one end of the wire plus a portion of the wire extending between two elements coupled respectively to the two ends of the body, the whole being so arranged that where each such elongated element joins 40 to the body one of the two passes of wire of that element is bent round a wire portion of the body, or of another element disposed

at the remote side of the body, whereby (short of stretching or snapping of the wire) the elongated elements are prevented from moving away from the body.

The body may advantageously include a wrapping by a portion adjacent the other end of the wire. Preferably said wrapping portion is constituted by a portion remaining after the wire has been formed into an elongated U-shape about the point of connection to the body of an element remote from the element next preceding the wrapping portion. In a preferred form, the two remote elements concerned are coupled to opposite ends of the body, e.g. one leg and a combined head and neck, joined to two ends of a trunk.

Whilst, in this description, reference is made to a "continuous" length of wire, it is to be understood that the wire is continuous at the time of first formation of the stiffener, but that the wire, e.g. the end loops of the elements, may be subsequently severed during completion of the moulded figure.

A method of moulding such figures comprises the steps of placing such a metallic wire stiffener in position adjacent to a first mould part with the body and elongated elements aligned with cavities in the mould part intended for reception of flexible material to form a coating applied to the stiffener, anchoring the end of each elongated element remote from the body to strainer means which are movable with respect to the mould part for placing the elongated elements under tension, straining said elongated elements such that the stiffener is held at a spacing from all of the faces of the mould cavities, positioning a counterpart second mould part face-to-face with the first mould part, inserting a material into the cavities of said two-part mould and allowing it to set into a flexible state, opening the mould, and releasing

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the stiffener from the strainer means. If desired, protruding end portions of the stiffener may be cut off after releasing the stiffener from the strainer means.

5 Any desired subsequent operations, such as paring, surface shaping and painting may be carried out on the moulding produced in this manner.

In order that the nature of the invention 10 may be readily ascertained, an embodiment of toy figure and its method of manufacture in accordance therewith are hereinafter particularly described with reference to the figures of the accompanying drawings, wherein:—

15 Fig. 1 is an elevation to show commencement of shaping of a length of wire into two arms each having two passes of the wire, and part of the trunk, neck and head, and a leg, of a toy human figure;

20 Figure 2 is an elevation showing the wire after shaping two legs each with two passes of the wire;

Figure 3 is an elevation showing the wire after completion of formation of the neck 25 and head, and the trunk, each with two passes of the wire;

Fig. 4 shows the wire after twisting of the two passes of wire forming the arms, legs, and neck and head;

30 Fig. 5 shows completion of the trunk by passing the wire about the back so as to add a further two passes thereto;

Fig. 6 shows the trunk after binding with the wire end;

35 Figure 7 shows the completed wire reinforcement in position on part of a mould;

Fig. 8 shows the wire with a toy human figure moulded onto it;

Fig. 9 shows the wire and moulding after 40 removal from the mould;

Fig. 10 shows the completed toy human figure, after trimming of excess wire portions from it.

A stiffener for the top figure is constructed 45 from a single continuous length W of stiff but bendable wire. The toy figure is an approximate representation of a human figure and has a short trunk (corresponding to the "body" referred to above) a neck and a head, two arms and two legs. In the case of a 50 toy animal, a tail could be added.

Using a suitable jig (not shown), the single length of wire is formed into a shape by the stages which can be ascertained by inspection 55 of Figs. 1 to 3. In this shape:—

1. One end of the wire is doubled at 1 for a length corresponding to the trunk.
2. The wire passes upwardly at 2 to the tip of the head and back again at 3 to shoulder level
3. At shoulder level the wire is turned laterally at 4 and carried at 5 to the tip of an arm and back again at 6 to the trunk, across the trunk at shoulder level at 7 to the tip of the other arm, and back again at 8 to the trunk.

4. It is turned downwardly at 9 along the length of the trunk at 10 and carried on along at 11 to the tip of one leg, and then back at 12 to the trunk.

5. It is then bent into an elongated U-shape at 13 about the adjacent end of the doubled length 1 and carried at 15 down the other leg to the tip, and then back at 16 to the trunk.

6. Referring now to Figures 4 to 6, the wire is then carried upwardly at 17 for the length of the trunk, bent into an elongated U-shape at 18 about the neck, and the remaining free end portion 19 bound at 20 round the portions of wire constituting the trunk.

7. The parallel wire portions of the head and neck, and of the four limbs are each individually twisted along their entire length, see Fig. 4.

With such a construction, the head-and-neck twisted pair 2, 3 has one of its wires 3 bent round at 4 at the upper end of the trunk and passing laterally into an arm at 5. The arm 5, 6 has its wire 5 bent round at 4 at the upper end of the trunk and passing into the head and neck. The arm 7, 8 has its wire 8 bent round at 9 at the upper end of the trunk and passing into the trunk. Each of the legs has a respective wire 12 or 15 bent round at 13 at the lower end of the trunk about a doubled portion of the trunk. As a result, the application of force, within reasonable limits, to pull the head-and-neck, or individual limbs, in a direction away from the trunk will not cause slipping of the wires and deformation of the stiffener. Of course, the application of the moulding material to the stiffener makes the possibility of such slipping even more remote.

In moulding the eventual toy figure, the stiffener S made in the manner described is placed on the face of a first mould part 21 which includes surface recesses 22 corresponding to half of the thickness of the eventual limbs, head-and-neck, and trunk of the toy figure. Slotted pegs 23 are included on the face of the mould part outwardly of the extremes of the limb portions of the moulding cavities. The twisted wire portions 24 of the stiffener are engaged into the slots of the pegs, and the loops 25 formed at the ends of the twisted wire portions are engaged with tenons 26 carried on blocks 27 which can be strained outwardly, with reference to the side walls of the mould part, by rotation of tensioning bolts 28 therein. The whole of the stiffener is tensioned until it is held taut within, and in alignment with, the mould cavities and at a spacing from the faces thereof. Then a second mould part (not shown) with counterpart cavities, is guided into position by pegs 29 and locked to the

first mould part. A suitable moulding material, such as liquid PVC is injected into the mould cavities and allowed to set, resulting in the wire-reinforced moulding seen in Fig. 8. The mould parts are separated, the tensioning means released, and the moulded figure removed, see Fig. 9. Loops 25 and adjacent twisted portions of wire protruding at the end of the head-and-neck, and 10 at the end of the limbs, are cut off flush with the ends of those parts, leaving the figure of Fig. 10, ready for final treatment, colouring, etc.

The construction of the stiffener in the manner described permits it to be placed under the strong tension necessary to ensure that it remains held up and adequately spaced from the faces of the mould cavities during the time of injection of the moulding material, whereby there is no risk, in the finished article, of the wire stiffener appearing at or close to the surface of the figure and giving an unsightly appearance or weakness of construction. Further, the inextensibility of the stiffener ensures that, even though bent many times and even roughly handled or placed under tension, the toy figure will not become deformed by separation of the head-and-neck, or a limb, from the trunk, or by a breakage occurring along these parts.

WHAT I CLAIM IS:—

1. A metallic wire stiffener, for incorporation in a toy human or animal figure of moulded flexible material, comprising elongated elements and a body, all of said elements and the body being formed from the same continuous length of wire, the elongated elements each being formed from two passes of the wire twisted together, the body including a portion of wire adjacent one end of the wire plus a portion of wire extending between two elements coupled respectively to the two ends of the body, the whole being arranged such that where each elongated element joins to the body one of the two passes of wire of that element is bent round a wire portion of the body, or of another element disposed at the remote side of the body, whereby the elongated elements are prevented from moving away from the body.
2. A metallic wire stiffener, as claimed in claim 1, wherein the body includes a wrapping by a portion adjacent the other end of the wire.
3. A metallic wire stiffener, as claimed in claim 2, wherein the said wrapping portion adjacent to the other end of the wire is a portion remaining after the wire has been formed into an elongated U-shape about the point of connection, to the body of an element remote from the element next preceding the wrapping portion.
4. A metallic wire stiffener, as claimed in claim 3, wherein the two remote elements are coupled to opposite ends of the body.
5. A toy human or animal figure made of moulded flexible material and incorporating a metallic wire stiffener of the kind set forth in any one of claims 1 to 4.
6. A method of moulding a toy human or animal figure comprising the steps of placing a metallic wire stiffener, of the kind set forth in any one of claims 1 to 4, in position adjacent to a first mould part with the body and elongated elements aligned with cavities in the mould part intended for reception of flexible material to form a coating applied to the stiffener, anchoring the end of each elongated element remote from the body to strainer means which are movable with respect to the mould part for placing the elongated elements under tension, straining said elongated elements such that the stiffener is held at a spacing from all of the faces of the mould cavities, positioning a counterpart second mould part face-to-face with the first mould part, inserting a material into the cavities of said two-part mould and allowing it to set into a flexible state, opening the mould, and releasing the stiffener from the strainer means.
7. A method, as claimed in claim 6, wherein protruding end portions of the stiffener are cut off after releasing the stiffener from the strainer means.
8. A toy human or animal figure when made by the method set forth in either of claims 6 and 7.
9. A metallic wire stiffener, for incorporation in a toy human figure, substantially as described herein with reference to Figures 1 to 6 of the accompanying drawings.
10. A toy human figure substantially as described herein with reference to Figures 7 to 10 of the accompanying drawings.
11. The method of moulding a toy human or animal figure, incorporating a metallic wire stiffener of the kind set forth in any one of claims 1 to 4, substantially as described herein.

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Fig. 1.

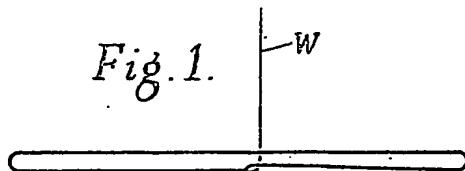


Fig. 2.

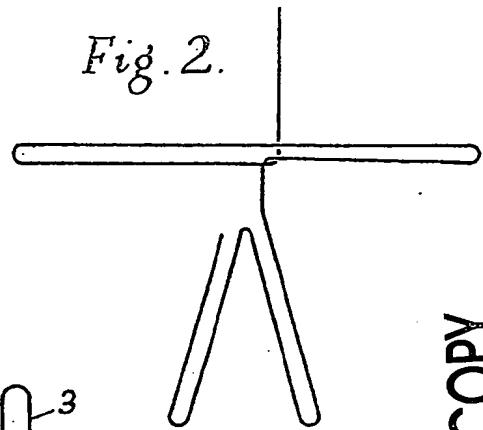


Fig. 3.

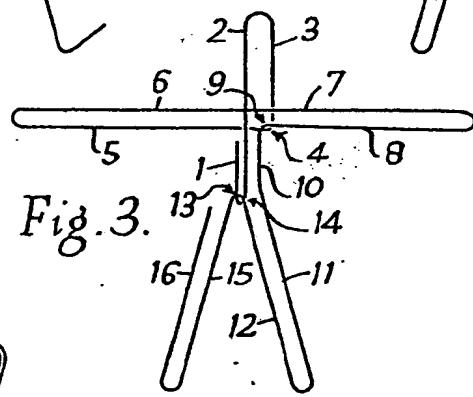


Fig. 4.

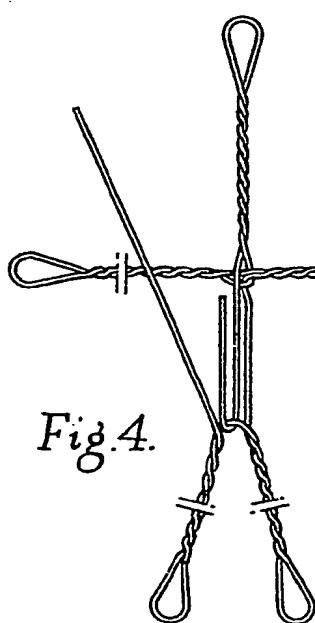


Fig. 5.

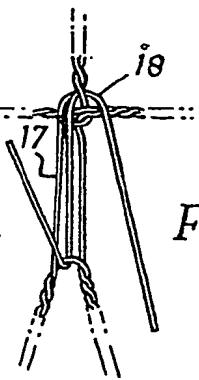
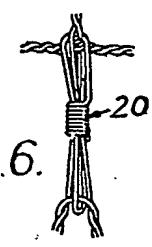


Fig. 6.



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SHEETS 1 & 2

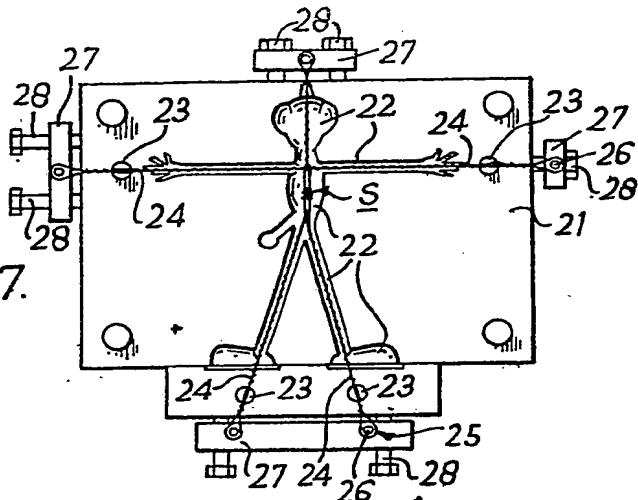


Fig. 7.

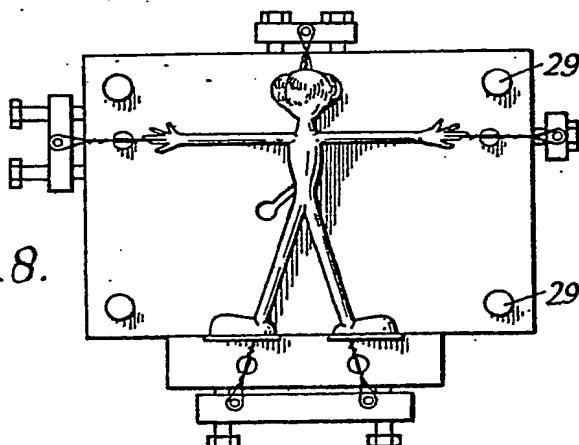


Fig. 8.

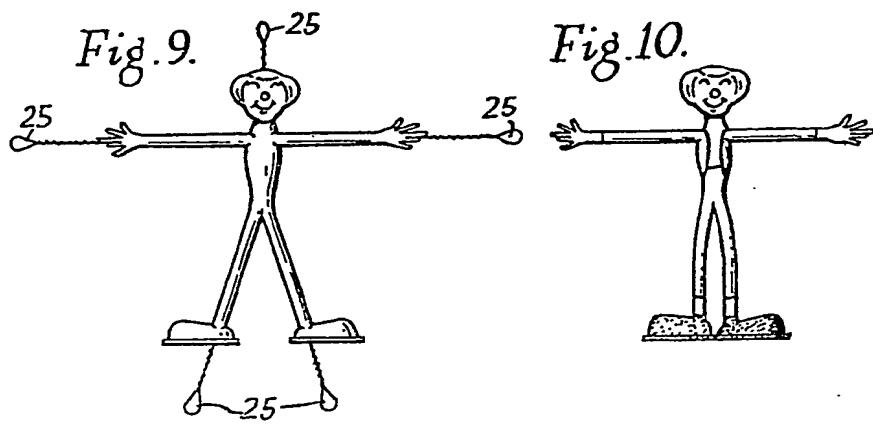
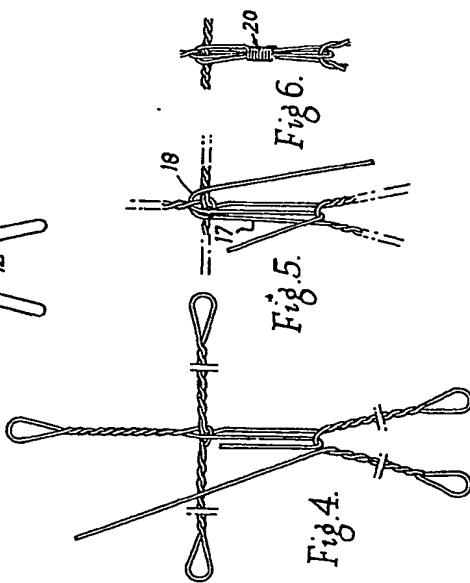
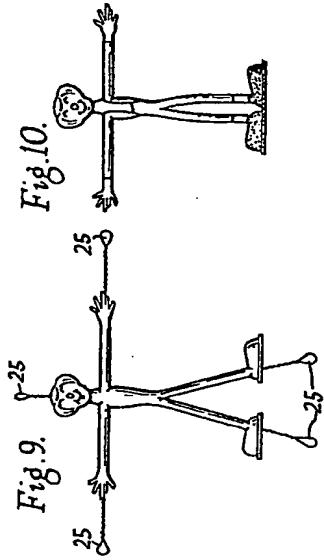
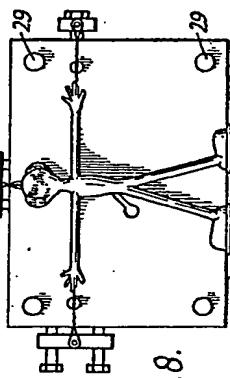
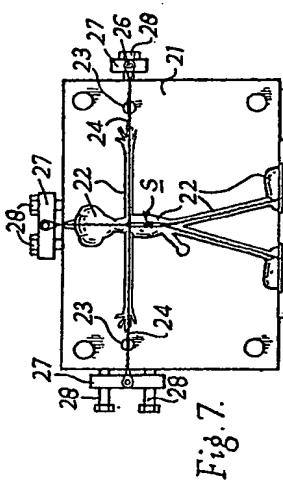
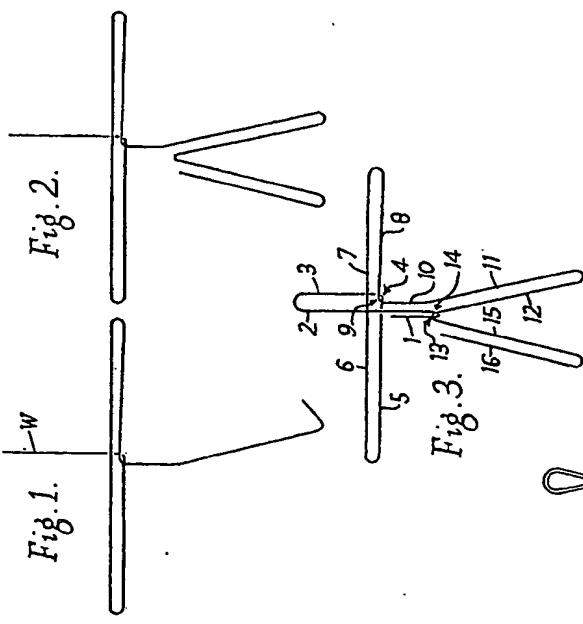


Fig. 9.

Fig. 10.

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the Original on a reduced scale.
SHEETS 1 & 2



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